L41 ANSWER 1 OF 3 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1981:193321 CAPLUS
DN 94:193321
ED Entered STN: 12 May 1984
TI Automobile carpets
PA Chisso Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC B60N003-04; B32B027-12; B32B027-32
CC 37-2 (Plastics Fabrication and Uses)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 55152630	A2	19801128	JP 1979-58774	19790514 <--
	JP 56014491	B4	19810404		
PRAI	JP 1979-58774		19790514		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 55152630	IC	B60N003-04IC B32B027-12IC B32B027-32

AB Polypropylene (I) flat yarns are drawn 400-1000% at 9-170°, set at 130-70° with 10-30% shrinkage, woven, piled with fibers, and backed with amorphous 10-60:40-90 ethylene-propylene copolymer (II) [9010-79-1] (melt index 0.5-100) to give floor coverings for automobiles with good press formability. Thus, a nylon-piled carpet with a 100-denier I flat yarn base fabric (700% drawing at 120°, set at 140° with 20% shrinkage) is back coated with molten, amorphous 40:60 II to 10 mm, cut to size, heated to 80°, and pressed 2 min to give a carpet with the contour of an automobile floor.
ST automobile carpet base fabric; polypropene fiber carpet automobile; ethylene copolymer carpet automobile; propylene copolymer carpet automobile; nylon pile carpet automobile
IT Carpets
(automotive, polypropene fiber-polyolefin backing for moldable)
IT Automobiles
(carpets for, moldable)
IT Polypropene fibers, uses and miscellaneous
RL: USES (Uses)
(carpets, for automobiles, moldable)
IT 9010-79-1
RL: USES (Uses)
(carpet backings, for automobiles)
RN 9010-79-1

L41 ANSWER 2 OF 3 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 1981-06938D [05] WPIX
TI Automobile carpet having vibration absorption properties - obtd. by providing backing layer of non-crystalline ethylene -propylene polymer on woven cloth of stretched polypropylene.
DC A17 A82 A95 F06 P73 Q14
PA (CHCC) CHISSO CORP
CYC 1
PI JP 55152630 A 19801128 (198105)*
JP 56014491 B 19810404 (198118) <--
PRAI JP 1979-58774 19790514
IC B32B027-12; B60N003-04
AB JP 55152630 A UPAB: 19930915
The carpet is obtd. by providing a backing layer composed of a noncrystalline ethylene-propylene, containing 10 to 60 weight% ethylene and having a melt flow rate of 0.5 to 100, by-produced in the mfr. of

crystalline ethylene-propylene block copolymer on a woven cloth as the prim. base cloth, composed of a stretched polypropylene filament subjected to a 4-10 times-stretching treatment at 90-170 deg.C followed by a 10-30 % loosening anneal treatment at 130-170 deg.C. The backed cloth is then subjected to a press processing at 50 deg.C or more to form it into the shape of the floor of an automobile.

The woven cloth as the primary base cloth used includes nylon, polyester, rayon, polypropylene, polyethylene, PVC or other material-woven clothes. The carpet has excellent in vibration absorbability, cushioning property, sound shielding property, heat insulating property, etc. and also can be easily manufactured on a mass-production basis.

FS CPI GMPI
FA AB
MC CPI: A04-G03E; A04-G06; A12-B02; A12-T04B; F02-A03A; F03-E01; F04-E03

L41 ANSWER 3 OF 3 JAPIO (C) 2004 JPO on STN
AN 1980-152630 JAPIO
TI CAR CARPET
IN WATANABE TAKESHI; HARUTA HIROSHI; GOTO NOBUO; YOSHIZAKI MICHIO
PA CHISSO CORP
PI **JP 55152630** A 19801128 Showa
AI JP 1979-58774 (JP54058774 Showa) 19790514
PRAI JP 1979-58774 19790514
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1980
IC ICM B60N003-04
ICA B32B027-12; B32B027-32
AB PURPOSE: To obtain a car carpet with high capacities for thermal insulation and others by applying a certain sort of noncrystalline copolymer of ethylene and propylene as a back-coating material to a primary substrate made of polypropylene under some conditions.
CONSTITUTION: A cloth woven by line-shaped drawn materials of polypropylene annealed for relaxation at 130∼170°C with a relaxation rate of 10∼30% after drawn 4∼10 times longer at 90∼170°C, is used for a primary substrate. On the rear side of the substrate, a layer of noncrystalline ethylene-propylene copolymer made as a by-product of crystalline ethylene-propylene block copolymer, with a melt flow rate (measured at 230°C and 2.16kg of load) 0.5∼100 containing 10∼60wt% of ethylene, is applied as a back-coating layer for making a tufted carpet. It is processed by pressing and heating above 50°C, and shaped to fit to an uneven car floor. The obtained back-coating material can be easily stuck to the primary substrate.

=>

10/602651

PTO 04-4866

Japanese Kokai Patent Application No.
Sho 55[1980]-152630

CARPET FOR AUTOMOBILE

Katashi Watanabe, et al.

UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. AUGUST 2004
TRANSLATED BY THE RALPH MCELROY TRANSLATION COMPANY

JAPANESE PATENT OFFICE
PATENT JOURNAL (A)
KOKAI PATENT APPLICATION NO. SHO 55[1980]-152630

Int. Cl.[3]:	B 60 N 3/04 //B 32 B 27/12 27/32
Sequence Nos. for Office Use:	7438-3B 7166-4F
Filing No.:	Sho 54[1979]-58774
Filing Date:	May 14, 1979
Publication Date:	November 28, 1980
No. of Inventions:	1 (Total of 5 pages)
Examination Request:	Not filed

CARPET FOR AUTOMOBILE

[Jidosha yo kapetto]

Inventors: Katashi Watanabe, et al.

Applicant: Chisso Corp.

[There are no amendments to this patent.]

Claim

A type of carpet for an automobile characterized by the following facts: the tufted carpet has a primary base cloth prepared by weaving linear drawn polypropylene, which is drawn at 4-10 fold at 90-170°C, followed by a relaxation annealing treatment with a relaxing rate of 10-30% at 130-170°C; on the inner surface of the primary base cloth, there is a back coating layer made of a layer of amorphous ethylene propylene copolymer, a side-product when crystalline propylene-ethylene block copolymer is manufactured, having a melt flow rate (MFR) of 0.5-100 and an ethylene content of 10-60 wt%; while the above is heated to 50°C or higher, it is subject

to press processing into a shape that fits the recessions/protrusions of the surface of the floor of the automobile.

Detailed explanation of the invention

This invention pertains to a novel type of carpet for an automobile. More specifically, this invention pertains to a type of tufted carpet for an automobile characterized by the fact that it has excellent vibration absorptivity, an excellent cushioning property, soundproof property, heat insulating property, etc., and is appropriate for mass production.

At present, the largest quantity tufted carpet is used as carpet for automobiles. Its primary base cloth is mainly a woven fabric of jute, a natural product. However, all jute is imported, and problems relating to supply and price stability exist. Consequently, there is a high demand for a substitute. Examples of possible substitutes include linear drawn polypropylene, spun polyester yarn, etc. In consideration of cost, linear drawn polypropylene is preferred. Linear drawn polypropylene is better than jute in several properties, such as water-proofness, corrosion resistance, strength, tufting characteristics, etc. If it can be used as a substitute, significant advantages would result.

For presently used tufted carpet for automobiles, for the back coating layer between the primary base cloth and the lowest under-felt, polyethylene prepared using the high-pressure method is used, and it acts to fix the piles on the base cloth and to bond the primary base cloth to the under-felt. However, when linear drawn polypropylene is used as the primary base cloth, the bonding property between the polypropylene prepared using the high-pressure method and the polypropylene base cloth is poor, so that in the later shape molding processing step for the carpet and during use of the carpet, separation between the primary base cloth and the back coating layer readily occurs. This is undesired. Consequently, its use is limited to carpets of simple shape and free of deep embossing, etc. Also, because polypropylene prepared using the high-pressure method has a relatively high melting point of about 110°C, the temperature for bonding processing between the primary base cloth and the back coating layer has to be rather high. Consequently, thermal shrinkage takes place in the primary base cloth made of linear drawn polypropylene. In order to prevent this problem, one has to use expensive low-thermal shrink drawn materials.

As a result, primary base cloth made of polypropylene has been used widely in general purpose carpets excluding carpets dedicated for use in automobiles, but it is seldom used for carpets for automobiles at present. In addition, for polypropylene prepared using the high-pressure method, for reasons of molding processability, it is impossible to form a thick back coating. Usually, the thickness of the back coating layer is only about 400 μm. This is

insufficient for realization of a sufficiently good noise property, vibration absorptivity, and cushioning property by the carpet for an automobile.

In order to solve the aforementioned problems pertaining to the case of use of a base cloth made of polypropylene, the present inventors have performed extensive research on a method for obtaining carpet for an automobile with excellent properties and low price. As a result of said research, it was found that by using a primary base cloth made of polypropylene manufactured under prescribed conditions and a back coating material made of amorphous ethylene propylene copolymer of a prescribed type and prepared as by-product, it is possible to obtain a carpet for automobiles with excellent properties. As a result, this invention was achieved.

That is, this invention provides a type of carpet for an automobile characterized by the following facts: the tufted carpet has a primary base cloth prepared by weaving linear drawn polypropylene, which is drawn at 4-10 fold at 90-170°C, followed by a relaxation annealing treatment with a relaxing rate of 10-30% at 130-170°C; on the inner surface of the primary base cloth, there is a back coating layer made of a layer of amorphous ethylene propylene copolymer, a by-product when crystalline propylene-ethylene block copolymer is manufactured, having a melt flow rate (MFR, measured at 230°C and under a load of 2.16 kg) of 0.5-100 and an ethylene content of 10-60 wt%; while the above is heated, it is subject to press processing into a shape that fits the recessions/protrusions of the surface of the floor of the automobile.

The linear drawn polypropylene used in this invention as feed material of the primary base cloth refers to flat yarns, slit yarns, special mono-filaments with a flat cross-sectional shape, etc. prepared from polypropylene or a copolymer mainly made of polypropylene as the feed material. The conditions for manufacturing said drawn substance include a drawing temperature in the range of 90-170°C and a drawing rate of 4-10 fold. These are within conventionally known condition ranges for manufacturing polypropylene drawn substances of this type. If the drawing temperature is too low, shrinkage of the drawn substance becomes too large. On the other hand, if the drawing rate is too high, the drawn substance is prone to fibril formation. Consequently, caution should be exercised. Relaxing annealing is performed at 130-170°C with a relaxing rate of 10-30%. If the temperature is lower than 130°C, thermal shrinkage after annealing becomes too large, and this is undesired. If an annealing treatment is not performed, the shrinkage becomes too large for use.

Examples of piles planted on the base cloth include conventionally used drawn materials of nylon, polyester, rayon, polypropylene, polyethylene, polyvinyl chloride, polyvinylidene chloride, etc. There is no special limitation on the pile material.

According to this invention, the amorphous ethylene propylene copolymer for use as the back coating material is so-called atactic polypropylene, which is formed as a by-product in the manufacture of impact-resistant propylene-ethylene block copolymer from propylene and

ethylene by means of a Ziegler-Natta catalyst, and which is highly soluble in hexane, heptane, or other hydrocarbon based solvents. Basically, when impact-resistant propylene-ethylene copolymer is manufactured, first, propylene is polymerized; then, ethylene or ethylene and propylene are block copolymerized. After said polymerization, the product is divided into a portion that is insoluble in hexane or heptane or other solvents, and a soluble portion. For the soluble portion, after removal of the solvent, the ethylene propylene copolymer of this invention is obtained. The quantity of the product is 20 wt% or less of the quantity of the conventional block copolymer. The molecular weight of the copolymer depends on the molecular weight of the block copolymer principal product. Also, its properties vary somewhat. In any case, it has good elasticity at room temperature like that of rubber. However, if the MFR is over 100, the mechanical strength of the copolymer decreases, and plastic deformation readily takes place at room temperature. Consequently, this is undesired for use for the purpose of this invention. Also, it is preferred that the content of ethylene be in the range of 10-60 wt%. If this range is not observed, the purpose of this invention cannot be realized due to problems in strength, softening temperature, etc.

Regarding the so-called atactic amorphous type polypropylene, in addition to copolymer obtained as a by-product in manufacturing said block copolymer, it can also be prepared as follows: material obtained as a by-product in manufacturing a homo-polymer of propylene, and by-product obtained in manufacturing a random copolymer of propylene and ethylene. For the former, the softening temperature is too low, and no elasticity exists. Consequently, it is inappropriate for application to this invention. On the other hand, for the latter, all elasticity is lost, and it is brittle, so it cannot be used.

Examples of the back coating material include material prepared by adding 80% or less of talc, mica, calcium carbonate, or another inorganic filler to ethylene propylene copolymer, and material prepared by adding 20% or less of crystalline polypropylene, polyethylene, or another polymer. Especially, when filler is added, the shape retentivity, soundproofness, etc. of the carpet can be further improved. Also, one may add a flame retarding agent to impart a flame retarding property.

For the back coating material prepared in this way, the bonding property with the primary base cloth made of polypropylene is excellent, and it has good softness and elasticity. Consequently, a large thickness of the back coating layer can be realized. As a result, it is possible to improve the performance of the carpet significantly.

The back coating layer may be prepared by extruding onto the primary base cloth with piles planted on it, and the result is fused as a laminate. Then, this is heated at 50°C or higher - 150°C or lower for pressing processing. In another scheme, manufacture is by extruding and molding a sheet of the back coating. This is heated and overlapped with the primary base cloth

with piles planted on it for pressing molding, so that formation of the back coating layer and shape molding are performed at the same time. In the former method, when the back coating layer is extruded and coated, the temperature is in the range of 120-200°C, and the base cloth with the applied back coating is heated at 50-150°C for pressing and shape molding. In the latter method, in which back coating and shape molding are performed at the same time, one side or both sides of the back coating material (when an under-felt layer is attached) are heated at 50-150°C by means of IR heating, and the surface is overlapped and pressed. In both methods, if the temperature of the back coating material is too high, shrinkage of the primary base cloth and the pile may result. Consequently, coating and pressing are performed at a temperature as low as possible. Also, in both methods, no heating is performed after pressing, and shape molding may be performed by means of a hot press at 50-150°C. A thickness of about 10 [illegible; possibly mm] for the back coating layer is appropriate in consideration of performance and economy.

After pressing molding, the carpet is allowed to sit to return to room temperature. As a result, the copolymer of the back coating layer becomes an intrinsic elastic body, and the obtained carpet for automobiles has an excellent cushioning property, vibration absorptivity, and soundproof property, and is free of shape collapse.

According to this invention, an under-felt layer can be further set beneath the back coating layer. This, however, is not a necessity since an appropriate thickness of the back coating layer can realize the role of the under-felt layer, namely, to provide a soundproof property, vibration absorptivity, and cushioning property. When an under-felt layer is formed, one may use various types of fiber debris commonly used by bonding this at the same time as pressing molding.

In the following, this invention will be explained in more detail with reference to application examples.

Application Example 1

A primary base cloth was prepared by weaving 100-denier polypropylene flat yarn treated by 7 fold drawing at 120°C, followed by an annealing treatment at 140°C with a relaxing rate of 20%. On the primary base cloth, drawn nylon [fibers] were planted as piles. On the inner side of the obtained base cloth, amorphous ethylene propylene copolymer prepared as a by-product in the manufacture of propylene-ethylene block copolymer and having an MFR of 3 and ethylene content of 40 wt% was extruded at 170°C to laminate, forming a back coating layer with a thickness of about 10 [illegible; possibly mm]. After cutting to a prescribed size, the back coating layer was heated under irradiation of IR rays at 80°C, and it was set on an under-felt layer preset on a press mold that fit the prescribed shape of the floor surface in an automobile.

Pressing was performed for 2 min, and a carpet for an automobile and with a prescribed shape was obtained.

For the obtained carpet, via the back coating layer made of a copolymer in the middle, the piles, primary base cloth, and under-felt layer are bonded to each other with high strength. When the carpet is set in an automobile, it should display an excellent soundproof property, vibration absorptivity, cushioning property, and shape retentivity.

Application Example 2

A sheet with thickness of 10 [illegible; possibly mm] was manufactured using an extrusion molding method from a feed material of a mixture of amorphous ethylene propylene copolymer prepared as a by-product in the manufacture of propylene-ethylene block copolymer and having an MFR of 50 and ethylene content of 20 wt%, and 50 wt% calcium carbonate with an average grain size of about 1 μm an. Then, the sheet was overlapped beneath the object obtained by planting nylon piles on a primary base cloth made of drawn polypropylene [fibers] in the same way as in Application Example 1. Then, an under-felt layer was set beneath this, and the laminate was heated at 80°C and set between dies having a prescribed shape for pressing under heating for 4 min to form a carpet with a prescribed shape.

Just as with the carpet obtained in Application Example 1, for the obtained carpet, the various layers of the structure have excellent adherence, and, when the carpet is set in an automobile, it displays excellent vibration absorptivity and an excellent cushioning property. Especially, its shape retentivity and soundproof property are superior to the results in Application Example 1.